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(NASA CR-55716; 05

t; improvement of nickel-cadmium

BATTERIES

(NO. 33 MONTHLY TECHNICAL PROGRESS REPORT (NO.

20 Hec. 1963-20 Jan 1664

COVERING THE PERIOD

20 December 1963 to 20 January 1964

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OTS PRICE

XEROX \$

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II CROFILM \$

0.80 mf.

Contract No. NAS 5-1048

Cook Technological Center

Dayton, Ohio

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PROGRESS REPORT NO. 33

I. INTRODUCTION

This progress report is submitted in accordance with Article I and Item 2 of Article II, of Contract NAS 5-1048.

II. CONTRACT OBJECTIVE

The objective of this contract is to improve nickelcadmium batteries through testing and analysis of failures.

Specifically, a number of batteries developed by manufacturers under NASA Contracts are being subjected to operational and environmental testing to determine failure rates
and modes of failure. From these results specific suggestions for the proper application and possible improvement
of this battery type may be made.

III. PROGRAM FOR THE REPORT PERIOD

Cycle-life tests were continued and data recorded on the following groups of cells:

| Number of Cells in Original Group | Mfr. | Depth of Discharge | Temp. •C | Cycles Completed |
|-----------------------------------|----------|-----------------------|----------|---------------------|
| | | | | |
| 10 | Sonotone | 10% | 25 | 6200+ |
| 10 | Gulton | 10% | 25 | 6200+ |
| 10 | Gould | 10% | 25 | 6200+ |
| 10 | Sonotone | 10% | 50 | 6000+ |
| 10 | Gulton | 10% | 50 | 6000÷ |
| 10 | Gould | 10% | 50 | 6000+ |

| Number of Cells | Mfr. | Depth of Discharge | Temp. •C | Cycles Completed |
|-------------------|----------|-----------------------|----------|---------------------|
| In Original Group | IVIII. | Discharge | | Completed |
| 10 | Sonotone | 25% | 25 | 5800+ |
| 10 | Gould | 25% | 25 | 3100+ |
| 10 | Gulton | 25% | 25 | 5800+ |
| 10 | Sonotone | 10% | -10 | 5700+ |
| 5 | Gould | 10% | -10 | 4600+ |
| 10 | Gulton | 10% | -10 | 5700+ |
| 4 | Sonotone | 40% | 25 | 4700+ |

No cells failed (discharge voltage below 0.9 volt) or were removed from cycling during the report period. However, the end-of-discharge voltage data for a few cells show evidence of impending failure of these cells.

IV. PROGRAM FOR THE NEXT PERIOD

- Continue and record data on cycle-life tests in progress at 25°C, -10°C, and 50°C.
- 2. Continue evaluation of data being accumulated.
- 3. Continue investigation of failed cells.

FINANCIAL CONDITION

CONTRACT NAS 5-1048

MONTHLY PROGRESS REPORT NO. 33

20 December 1963 to 20 January 1964

| *Funds Expended During Report Period | \$ | 190 |
|---|----|-------|
| *Commitments | N | one |
| *Total Funds Expended Including Commitments | 56 | 6,630 |
| *Funds Remaining | | 247 |
| * All Amounts are Less G & A and Fee | | |

DISPOSITION OF GULTON CELLS - REPORT NUMBER 33

Cells - Failed Initial Tests - - - 7

Cells - Failed in Cycling - - - - 5

Cells - Now Cycling - - - - 35

Cells - Not Used in Cycling - - - 3*

*3 Cells buiged after initial tests

CELLS FAILED IN CYCLING

At 38°C - 10% Discharge (5832 Cycles) - - - 1

At 38°C - 10% Discharge (2363 Cycles) - - - 1

11 30 38°C - 20% Discharge (1298 Cycles) - - - - 1

12 30 30 Cycles (1270 Cycles) - - - - 1

13 30 Cycles (1270 Cycles) - - - - 1

14 30 Cycles (1270 Cycles) - - - - - 1

15 30 Cycles (1270 Cycles

CELLS NOW CYCLING

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At 25°C - 10% Discharge - - - 9
At 25°C - 25% Discharge - - - 7
At 50°C - 10% Discharge - - - 9
At -10°C - 10% Discharge - - - - 10
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| CELLS FAILED IN CYCLING | |
| 50°C - 10% Discharge | |
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| (864, 864 - 282 cycles - cycling stopped on | TORAL DITOR |
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CELLS NOW CYCLING

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At 50°C - 10°S Bischarge - - - - - - 10°
At 50°C - 10°S Bischarge - - - - - 4
At -10°C - 10°S Bischarge - - - - - 3
At 20°C - 20°S Bischarge - - - - 3
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